



Case No.: 12-0835--EL-EEC

Mercantile Customer: **Valley Asphalt**

Electric Utility: **Duke Energy**

**Program Title or
Description:** **Multiple VFD Projects**

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. [10-834-EL-POR](#)

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at ee-pdr@puc.state.oh.us.

Section 1: Mercantile Customer Information

Name: **Valley Asphalt Corporation**

Principal address: **11641 Mosteller Rd Cincinnati, Ohio 45241**

Address of facility for which this energy efficiency program applies:

**309 Industrial Dr, Franklin Ohio 45005
4850 Stubbs Mill Rd, Morrow OH 45152
581 Garver Rd, Monroe OH 45050
7940 Main St, Newtown Ohio 45244
Kilby Rd, Cleves Ohio 45002**

Name and telephone number for responses to questions:

Grady Reid, Jr Duke Energy 513-287-1038

Electricity use by the customer (check the box(es) that apply):

- The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (Refer to Appendix A for documentation.)**
- The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section 2: Application Information

A) The customer is filing this application (choose which applies):

Individually, without electric utility participation.

Jointly with the electric utility.

B) The electric utility is: **Duke Energy**

C) The customer is offering to commit (check any that apply):

Energy savings from the customer's energy efficiency program. (Complete Sections 3, 5, 6, and 7.)

Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)

Both the energy savings and the capacity savings from the customer's energy efficiency program. (Complete all sections of the Application.)

Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (check those that apply):

- ✓ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).

The following new equipment was installed starting December 2009 and was finished May 2010.

**1 VFD on 100HP exhaust fan - 309 Industrial Dr
1 VFD on 100 HP exhaust fan - 4850 Stubbs Mill Rd
1 VFD on 100 HP exhaust fan - 581 Garver Rd
1 VFD on 100 HP exhaust fan - 7940 Main St
1 VFD on 100 HP exhaust fan - Kilby Rd**

- Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s):
_____.
- Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):
_____.
- Behavioral or operational improvement.

B) Energy savings achieved/to be achieved by the energy efficiency program:

- 1) If you checked the box indicating that the project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) - (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: 348,242 kWh (Refer to Appendix B for calculations and supporting documents).

- 2) If you checked the box indicating that the customer installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) - (kWh

used by the higher efficiency new equipment) = (kWh per year saved)].
Please attach your calculations and record the results below:

Annual savings: _____kWh

Please describe any less efficient new equipment that was rejected in favor of the more efficient new equipment.

- 3) If you checked the box indicating that the project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) - (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: _____kWh

Please describe the less efficient new equipment that was rejected in favor of the more efficient new equipment.

- 4) If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.
-

Section 4: Demand Reduction/Demand Response Programs

- A) The customer's program involves (check the one that applies):
- Coincident peak-demand savings from the customer's energy efficiency program.**
 - Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
 - Potential peak-demand reduction (check the one that applies):
 - The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
 - The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

- B) On what date did the customer initiate its demand reduction program?

New equipment was installed starting December 2009 and was finished May 2010.

- C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

33.6 kW

Refer to Appendix B for calculations and supporting documents.

Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) The customer is applying for:

Option 1: A cash rebate reasonable arrangement.

OR

Option 2: An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.

OR

Commitment payment

Certain projects completed by Valley Asphalt have payback below one year and, as such, qualify only for commitment payments. The remainder of projects received cash rebates. Details are outlined in Appendix C.

B) The value of the option that the customer is seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

- A cash rebate of **\$3200.00. Refer to Appendix C for documentation.** (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

- An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for _____ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

- ✓ A commitment payment valued at no more than **\$1216.00. Refer to Appendix C for documentation** (Attach documentation and calculations showing how this payment amount was determined.)

OR

- Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

- Total Resource Cost (TRC) Test. The calculated TRC value is: _____ (Continue to Subsection 1, then skip Subsection 2)
- Utility Cost Test (UCT) . The calculated UCT value is: **25.57** (Skip to Subsection 2.) **Refer to Appendix D for calculations and supporting documents.**

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The incremental measure costs were _____.

Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were **\$232,586**.

The utility's program costs were **\$4680**.

The utility's incentive costs/rebate costs were **\$4416**.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

Narrative description of the program including, but not limited to, make, model, and year of any installed and replaced equipment.

A copy of the formal declaration or agreement that commits the program or measure to the electric utility, including:

- 1) any confidentiality requirements associated with the agreement;
- 2) a description of any consequences of noncompliance with the terms of the commitment;
- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
- 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
- 5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

Refer to Rebate Offer letter following this application

A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

Please indicate your response to this rebate offer within 30 days of receipt.

Rebate is accepted.

Rebate is declined.

By accepting this rebate, Valley Asphalt affirms its intention to commit and integrate the energy efficiency projects listed on the following pages into Duke Energy's peak demand reduction, demand response and/or energy efficiency programs.

Additionally, Valley Asphalt also agrees to serve as joint applicant in any future filings necessary to secure approval of this arrangement as required by PUCO and to comply with any information and reporting requirements imposed by rule or as part of that approval.

Finally, Valley Asphalt affirms that all application information submitted to Duke Energy pursuant to this rebate offer is true and accurate. Information in question would include, but not be limited to, project scope, equipment specifications, equipment operational details, project costs, project completion dates, and the quantity of energy conservation measures installed.

If rebate is accepted, will you use the monies to fund future energy efficiency and/or demand reduction projects?

YES NO

If rebate is declined, please indicate reason (optional):

Fred Branner

FRED BRANNER

1-24-12

Customer Signature

Printed Name

Date

Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	VFD Heating Exhaust Fan (Qty 1 – 309 Industrial Dr)	\$450.00
ECM-2	VFD Heating Exhaust Fan (Qty 1 – 4850 Stubbs Mill Rd)	\$1600.00
ECM-3	VFD Heating Exhaust Fan (Qty 1 – 581 Garver Rd)	\$389.00
ECM-4	VFD Heating Exhaust Fan (Qty 1 – 7940 Main)	\$1600.00
ECM-5	VFD Heating Exhaust Fan (Qty 1 – Kilby Rd)	\$377.00
Total		\$4416.00



**Public Utilities
Commission**

**Application to Commit
Energy Efficiency/Peak
Demand Reduction
Programs
(Mercantile Customers
Only)**

Case No.: ___ - ___ -EL-EEC

State of Ohio :

Fred Brammer, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Fred Brammer

[insert customer or EDU company name and any applicable name(s) doing business as]

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.

3. I am aware of fines and penalties which may be imposed under Ohio Revised Code Sections 2921.11, 2921.31, 4903.02, 4903.03, and 4903.99 for submitting false information.

Fred Brammer Supt.
Signature of Affiant & Title

Sworn and subscribed before me this 24th day of January,
2012 Month/Year

Diane Carol Johnson
Signature of official administering oath

Diane Carol Johnson
Print Name and Title Notary Public

My commission expires on March 31, 2015



Diane Carol Johnson
Notary Public, State of Ohio
My Commission Expires 03-31-2015

Appendix A

43903686 01		
VALLEY ASPHALT CORP		
589 GARVER RDMISC: C		
MONROE, OH 45050		
Date	Days	Actual KWH
11/3/2011	29	1,734
10/5/2011	29	1,514
9/6/2011	32	1,948
8/5/2011	29	1,187
7/7/2011	30	1,547
6/7/2011	32	2,252
5/6/2011	30	2,365
4/6/2011	29	2,924
3/8/2011	29	5,633
2/7/2011	31	9,994
1/7/2011	32	11,192
12/6/2010	33	44,032
Total		86,322

08403616 01		
VALLEY ASPHALT CORP		
4850 STUBBSMILL RD		
MORROW, OH 45152		
Date	Days	Actual KWH
11/1/2011	29	62,760
10/3/2011	32	39,000
9/1/2011	28	38,160
8/4/2011	30	37,920
7/5/2011	32	57,000
6/3/2011	30	33,360
5/4/2011	30	13,080
4/4/2011	31	3,600
3/4/2011	29	4,080
2/3/2011	29	5,640
1/5/2011	33	6,480
12/3/2010	32	25,560
Total		326,640

39003692 01		
VALLEY ASPHALT CORP		
5073 KILBY RDBOX: B		
CLEVES, OH 45002		
Date	Days	Actual KWH
11/7/2011	31	50,229
10/7/2011	29	46,839
9/8/2011	30	35,609
8/9/2011	29	54,814
7/11/2011	32	68,838
6/9/2011	30	36,666
5/10/2011	32	25,009
4/8/2011	29	11,536
3/10/2011	29	10,246
2/9/2011	29	12,697
1/11/2011	34	13,557
12/8/2010	33	55,164
Total		421,204

84103711 01		
VALLEY ASPHALT CORP		
309 INDUSTRIAL DR		
FRANKLIN, OH 45005		
Date	Days	Actual KWH
11/15/2011	29	85,544
10/17/2011	31	125,573
9/16/2011	30	134,870
8/17/2011	29	110,578
7/19/2011	32	83,116
6/17/2011	30	44,650
5/18/2011	30	20,093
4/18/2011	31	20,850
3/18/2011	29	4,754
2/17/2011	29	5,652
1/19/2011	34	5,323
12/16/2010	31	50,377
Total		691,380

27302143 01					
VALLEY ASPHALT CO					
7940 MAIN					
CINCINNATI, OH 45244					
Bulked consumption from 5-19-11 for meter # 94273581 & 106939983 - Rate - DS					
Date	Days	Actual KWH			
11/16/2011	29	44,123			
10/18/2011	29	53,934			
9/19/2011	32	49,539			
8/18/2011	29	59,664			
7/20/2011	30	27,521			
6/20/2011	32	32,290			
Total		267,071			

See Appendix B At The End

Appendix C -Commitment Payment

Measure/Location	Total Energy Savings (kWh) AT THE METER	Total Demand Saving kW At The Meter	Commitment Payment Per kWh*	Commitment Payment Per kW*	Payment
VFD - 309 Industrial Dr, Franklin OH	78,959	7	0.005	\$10	\$450.00
VFD - 581 Garver Rd, Monroe OH	66,637	7	0.005	\$10	\$389.00
VFD - Kilby Rd, Cleves OH	61,972	7	0.005	\$10	\$377.00
					\$1,216.00

Note: Commitment payment is proposed for measures with payback < 1 year, per PUCO ruling. The calculation does not hold exactly due to energy modeling software error.

Note: kWh savings in the above table may differ slightly from applicant calculations due to avoided cost modeling rounding error.

Appendix C -Cash Rebate Calculation

VFD

Measure	Quantity	Cash Rebate Rate	Rebate
VFD - 4850 Stubbs Mill Rd, Morrow OH	1	50% of incentive that would be offered by the Smart Saver Custom program	\$1,600
VFD- 7940 Main St, Newtown OH	1	50% of incentive that would be offered by the Smart Saver Custom program	\$1,600
		<i>Total</i>	\$3,200.00

Total Rebate \$4,416.00

Appendix D -UCT Value

VFD

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
VFD - 309 Industrial Dr, Franklin OH	\$51,924	\$803	\$389	1	43.56
VFD - 4850 Stubbs Mill Rd, Morrow OH	\$43,411	\$680	\$377	1	41.07
VFD - 581 Garver Rd, Monroe OH	\$44,632	\$1,214	\$1,600	1	15.86
VFD- 7940 Main St, Newtown OH	\$49,887	\$1,292	\$1,600	1	17.25
VFD - Kilby Rd, Cleves OH	\$42,732	\$691	\$450	1	37.45
Totals	\$232,586	\$4,680	\$4,416	5	

Total Avoided Supply Costs \$232,586
 Total Program Costs \$4,680.00
 Total Incentive \$4,416

Aggregate Application UCT 25.57

Appendix B – Energy Savings Achieved

ECM	Pre-Project (at the meter)			Post-Project (at the meter)			Savings (at the meter)	
	As-Found Equipment	Total Annual kWh ¹	Summer Coincident kW ¹	New Equipment	Total Annual kWh ¹	Summer Coincident kW ²	Energy Savings (kWh)	Demand Savings (kW) ²
ECM1	100HP Conveyor Motor – Kilby Rd Site	197,276	67.1	VFD Added	135,303	60.4	61,972	6.7
ECM2	100HP Conveyor Motor – Main St Site	206,670	67.1	VFD Added	130,396	60.4	76,274	6.7
ECM3	100HP Conveyor Motor – Industrial Dr Site	211,367	67.1	VFD Added	132,407	60.4	78,959	6.7
ECM4	100HP Conveyor Motor – Garver Rd Site	192,914	67.1	VFD Added	126,277	60.4	66,637	6.7
ECM5	100HP Conveyor Motor – Stubbs Mill Rd Site	187,613	67.1	VFD Added	123,214	60.4	64,399	6.7
Total							348,242	33.6

Notes:

1. Energy consumption baseline, demand baseline and post-project energy consumption basis are outlined in the following pages.
2. Demand savings are returned by DSMore software as a result of energy savings allocations at the coincident hour. Post-project demand is calculated as the difference between pre-project modeled demand and the DSMore software result. An exception occurs where it was identified that the addition of the VFD introduces the possibility of a demand increase at the coincident hour. In these cases, the expected demand increase is applied.

Application of 7.43% line losses yields **364,037 kWh** savings and **36.0 coincident kW** savings at the plant. This number also reflects insignificant rounding error due to the analytical mode used to model this project in DSMore software.

ENERGY SAVINGS CALCULATIONS - INPUT DATA
VARIABLE FREQUENCY DRIVE (VFD)

SECTION 1 - GENERAL INFORMATION

6	Applicant name	Valley Asphalt Corp.
7	Facility name	Kilby Road, Cleves, Ohio
8	ECM	ECM-1: VFD for Kilby Road Location

App No.	11-423
Rev.	0

10	Driven Equipment and Motor Information	
11	Equipment Identification	100 HP conveyor
12	Quantity of Equipment	1
13	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	85.0 BHP
14	Nameplate HP of Driven Equipment Motor	100.0 motor HP

SECTION 2 - BASE CONDITION OPERATION without VFD

18	% of Full Load bHP of Driven Equipment	Driven Equipment @ Actual Load (BHP)	Driven output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (see Notes 2 & 3)	Hours that each motor runs during the month (see Notes 3 & 4)												Yearly Total (hr)					
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
19	100	85.0	85%	94.5	67.10		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760	
20	100	85.0	85%	94.5	67.10		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760	
21		0.0	0%	NA	#DIV/0!																			0
22	Not Running	0.0	0%	NA	0.00	8,760	744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760	
23	Totals																							

SECTION 3 - PROPOSED OPERATION with VFD

27	Efficiency of VFD	97
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29	% of Full Load Capacity of Driven Equipment	Driven Equipment @ Actual Load (BHP)	Driven output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (Notes 2 & 3)	Hours that each motor runs during the period (see Notes 3 & 4)												Yearly Total (hr)				
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
30	100	85.0	85%	94.5	67.10		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
31	100	85.0	85%	94.5	67.10		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
32	90	76.5	77%	94.5	60.39		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
33	80	68.0	68%	94.5	53.68		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
34	70	59.5	60%	94.5	46.97		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
35	60	51.0	51%	94.0	40.47		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
36	50	42.5	43%	93.5	33.91		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
37	40	34.0	34%	93.0	27.27		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
38	30	25.5	26%	92.5	20.57		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
39	20	17.0	17%	92.0	13.78		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
40	10	8.5	9%	91.5	6.93		744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
41	Total Running	NA	NA	NA	NA	0	744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
42	Not Running	NA	NA	NA	NA	0	744	672	744	720	744	744	720	744	744	720	744	720	744	744	720	744	8,760
43	Totals																						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name		Valley Asphalt Corp.																		
7	Facility name		Kilby Road, Cleves, Ohio																		
44																					
45	NOTES:																				
46	1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD																				
47	2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., dependin																				
48	on weather conditions or other season conditions), then leave column H blank and fill in Columns I through -																				
49	3. Input values are to be entered for ONE driven equipment and its motor. The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1																				
50	4. If the motor runs continuously during a month, use the following values for the total hours for that month:																				
51	* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec																				
52	* 672 for Feb																				
53	* 720 for Apr, Jun, Sep, & Nov																				
54	If the motor runs only a percentage of the time, use a value proportional to these values																				
55																					
56																					
57																					
58																					
59																					
60																					
61																					
62																					
63																					
64																					
65																					
66																					
67																					
68																					
69																					

App No. 11-423
Rev. 0

NOTE: all information per the "2011-12-13 Revised Part 2.pdf" file

SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION

	Energy Demand (kw)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Other														0.0
Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1

	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	20,130	20,801	21,137	20,801	21,808	26,840	22,814	21,472	21,472	0	197,276
Total	0	0	20,130	20,801	21,137	20,801	21,808	26,840	22,814	21,472	21,472	0	197,276

ENERGY SAVINGS CALCULATIONS - INPUT DATA

NOTE: all information per the "2011-12-13 Revised Part 2.pdf" file

VARIABLE FREQUENCY DRIVE (VFD)

SECTION 1 - GENERAL INFORMATION

6	Applicant name	Valley Asphalt Corp.	App No. 11-423
7	Facility name	Kilby Road, Cleves, Ohio	Rev. 0

SECTION 5 - PROPOSED DEMAND AND CONSUMPTION

	% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												Annual		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
73	100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	90%	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
75	80%	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7
76	70%	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
77	60%	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
78	50%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
79	40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
80	30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
81	20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
82	10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
83	Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4

	% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												Annual		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
86	100%	0	0	0	3,623	3,925	4,227	4,529	4,831	4,227	4,529	4,831	4,227	3,623	0	36,536
87	90%	0	0	3,221	2,952	2,952	3,489	3,489	3,489	3,489	3,489	3,489	3,489	2,952	0	29,524
88	80%	0	0	2,349	2,349	2,583	2,114	2,583	2,818	3,053	2,818	3,053	2,818	2,349	0	23,015
89	70%	0	0	2,024	2,024	1,821	1,619	1,619	1,619	1,619	1,619	1,619	1,619	2,024	0	17,606
90	60%	0	0	1,356	1,526	1,187	1,356	1,526	1,526	1,526	1,526	1,526	1,526	1,526	0	12,885
91	40%	0	0	955	818	818	818	818	818	818	818	818	818	1,091	0	8,318
92	30%	0	0	617	514	514	514	514	514	514	514	514	514	617	0	4,936
93	20%	0	0	276	276	276	276	276	276	276	276	276	276	276	0	2,481
94	10%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	Total	0	0	14,420	14,082	14,077	13,575	15,292	16,094	17,646	15,659	14,458	15,659	14,458	0	135,303

SECTION 6 - SAVINGS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
102	Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
103	Energy Use (kw-hr)	0	0	5,710	6,719	7,059	7,226	6,516	10,746	5,168	7,015	7,015	61,972	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name	Valley Asphalt Corp.																			
7	Facility name	7940 Main St, Newtown, Ohio																			
8	ECM	ECM-2: VFD for Main Street Location																			
9																					
10	Driven Equipment and Motor Information																				
11	Equipment Identification	100 HP conveyor																			
12	Quantity of Equipment	1																			
13	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	85.0 BHP																			
14	Nameplate HP of Driven Equipment Motor	100.0 motor HP																			
15																					
16	SECTION 2 - BASE CONDITION OPERATION without VFD																				
17																					
18	Hours that each motor runs during the month (see Notes 3 & 4)																				
19	% of Full Load bHP of Driven Equipment	Driven Equipment @ Actual Load (BHP)	output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (see Notes 2 & 3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total (hr)		
20	100 %	85.0	85%	94.5 %	67.10		744	672	744	725	749	735	739	794	780	774	700	744	8,900		
21	%	0.0	0%	%	#DIV/0!														3,080		
22	Not Running	0.0	0%	NA	0.00	8,760	744	672	744	725	749	735	739	794	780	774	700	744	5,820		
23	Totals					8,760	744	672	744	725	749	735	739	794	780	774	700	744	8,900		
24																					
25	SECTION 3 - PROPOSED OPERATION with VFD																				
26																					
27	Efficiency of VFD	97 %																			
28																					
29	Hours that each motor runs during the period (see Notes 3 & 4)																				
30	% of Full Load Capacity of Driven Equipment	Driven Equipment @ Actual Load (BHP)	output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (Notes 2 & 3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total (hr)		
31	100 %	85.0	85%	94.5 %	67.10		744	672	744	720	744	720	744	744	720	744	720	744	8,760		
32	90 %	76.5	77%	94.5 %	60.39														0		
33	80 %	68.0	68%	94.5 %	53.68														660		
34	70 %	59.5	60%	94.5 %	46.97														570		
35	60 %	51.0	51%	94.0 %	40.47														500		
36	50 %	42.5	43%	93.5 %	33.91														375		
37	40 %	34.0	34%	93.0 %	27.27														255		
38	30 %	25.5	26%	92.5 %	20.57														210		
39	20 %	17.0	17%	92.0 %	13.78														215		
40	10 %	8.5	9%	91.5 %	6.93														180		
41	Total Running	NA	NA	NA	NA	0	0	0	280	290	310	320	335	370	370	365	325	0	2,965		
42	Not Running	NA	NA	NA	NA	744	672	744	720	744	744	720	744	744	720	744	720	744	5,795		
43	Totals					0	744	672	744	720	744	720	744	744	720	744	720	744	8,760		

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name		Valley Asphalt Corp.																		
7	Facility name		7940 Main St, Newtown, Ohio																		
44																					
45	NOTES:																				
46	1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD																				
47	2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., dependin																				
48	on weather conditions or other season conditions), then leave column H blank and fill in Columns I through -																				
49	3. Input values are to be entered for ONE driven equipment and its motor. The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1																				
50	4. If the motor runs continuously during a month, use the following values for the total hours for that month:																				
51	* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec																				
52	* 672 for Feb																				
53	* 720 for Apr, Jun, Sep, & Nov																				
54	If the motor runs only a percentage of the time, use a value proportional to these values																				
55																					
56																					
57																					
58																					
59																					
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SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION

	Energy Demand (kw)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Other														0.0
Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1

	Energy Usage (kw-hr)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	20,130	21,137	21,472	21,808	21,472	30,195	26,840	23,485	20,130	0	0	206,670
Total	0	0	20,130	21,137	21,472	21,808	21,472	30,195	26,840	23,485	20,130	0	0	206,670

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
VARIABLE FREQUENCY DRIVE (VFD)																				
SECTION 1 - GENERAL INFORMATION																				
6	Applicant name																			
7	Facility name																			
70	Valley Asphalt Corp.																			
71	7940 Main St, Newtown, Ohio																			
72																				
73																				
74																				
75																				
76																				
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SECTION 5 - PROPOSED DEMAND AND CONSUMPTION

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90%	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
80%	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7
70%	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
60%	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
50%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90%	0	0	3,623	3,623	3,623	4,831	4,227	5,133	5,133	5,435	4,227	0	39,858	
80%	0	0	2,147	2,684	3,221	3,758	4,294	4,294	3,758	4,294	2,147	0	30,598	
70%	0	0	2,349	2,349	2,349	2,818	2,349	2,818	2,818	2,818	2,818	0	23,485	
60%	0	0	1,619	1,619	1,619	1,214	1,619	2,024	2,024	1,821	1,619	0	15,178	
50%	0	0	1,017	1,017	1,017	678	848	1,017	1,017	848	1,187	0	8,647	
40%	0	0	545	545	545	545	545	682	682	682	955	0	5,727	
30%	0	0	411	411	617	411	617	411	617	411	514	0	4,422	
20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481	
10%	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	11,988	12,525	13,267	14,532	14,775	16,656	16,325	16,586	13,743	0	130,396	

SECTION 6 - SAVINGS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
Energy Use (kw-hr)	0	0	8,142	8,612	8,205	7,276	6,697	13,540	10,516	6,899	6,387	0	76,274

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name	Valley Asphalt Corp.																			
7	Facility name	309 Industrial Dr, Franklin Ohio																			
8	ECM	ECM-3: VFD for Industrial Dr. Location																			
9																					
10	Driven Equipment and Motor Information																				
11	Equipment Identification	100 HP conveyor																			
12	Quantity of Equipment	1																			
13	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	85.0 BHP																			
14	Nameplate HP of Driven Equipment Motor	100.0 motor HP																			
15																					
16	SECTION 2 - BASE CONDITION OPERATION without VFD																				
17																					
18	Hours that each motor runs during the month (see Notes 3 & 4)																				
19	% of Full Load bHP of Driven Equipment	Driven Equipment Load @ Actual (BHP)	Motor output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (see Notes 2 & 3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total (hr)		
20	100 %	85.0	85%	94.5 %	67.10		744	672	444	410	429	410	340	500	375	350	300	744	3,150		
21	%	0.0	0%	%	#DIV/0!														0		
22	Not Running	0.0	0%	NA	0.00	8,760	744	672	444	410	429	410	340	500	375	350	300	744	5,820		
23					Totals	8,760	744	672	744	735	759	720	759	844	755	774	700	744	8,970		
24																					
25	SECTION 3 - PROPOSED OPERATION with VFD																				
26																					
27	Efficiency of VFD	97 %																			
28																					
29	Hours that each motor runs during the period (see Notes 3 & 4)																				
30	% of Full Load Capacity of Driven Equipment	Driven Equipment Load @ Actual (BHP)	Motor output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (Notes 2 & 3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total (hr)		
31	100 %	85.0	85%	94.5 %	67.10														0		
32	90 %	76.5	77%	94.5 %	60.39														635		
33	80 %	68.0	68%	94.5 %	53.68														565		
34	70 %	59.5	60%	94.5 %	46.97														465		
35	60 %	51.0	51%	94.0 %	40.47														390		
36	50 %	42.5	43%	93.5 %	33.91														345		
37	40 %	34.0	34%	93.0 %	27.27														260		
38	30 %	25.5	26%	92.5 %	20.57														235		
39	20 %	17.0	17%	92.0 %	13.78														180		
40	10 %	8.5	9%	91.5 %	6.93														0		
41	Total Running	NA	NA	NA	NA	0	0	305	315	325	355	355	355	360	365	355	340	355	3,075		
42	Not Running	NA	NA	NA	NA	744	672	439	405	419	365	389	389	384	355	389	380	744	5,685		
43					Totals	0	744	672	744	720	744	720	744	744	720	744	720	744	8,760		

Per "2011-12-13 Revised Part 2.pdf"

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name		Valley Asphalt Corp.																		
7	Facility name		309 Industrial Dr, Franklin Ohio																		
44																					
45	NOTES:																				
46	1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD																				
47	2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., dependin																				
48	on weather conditions or other season conditions), then leave column H blank and fill in Columns I through -																				
49	3. Input values are to be entered for ONE driven equipment and its motor. The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1																				
50	4. If the motor runs continuously during a month, use the following values for the total hours for that month:																				
51	* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec																				
52	* 672 for Feb																				
53	* 720 for Apr, Jun, Sep, & Nov																				
54	If the motor runs only a percentage of the time, use a value proportional to these values																				
55																					
56																					
57																					
58																					
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SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION

	Energy Demand (kw)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Other														0.0
Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1

	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	21,472	21,808	22,143	20,801	22,814	33,550	25,163	23,485	20,130	0	211,367
Total	0	0	21,472	21,808	22,143	20,801	22,814	33,550	25,163	23,485	20,130	0	211,367

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
VARIABLE FREQUENCY DRIVE (VFD)																				
SECTION 1 - GENERAL INFORMATION																				
6	Applicant name																			
7	Facility name																			
70	Valley Asphalt Corp.																			
71	309 Industrial Dr, Franklin Ohio																			
72																				
73																				
74																				
75																				
76																				
77																				
78																				
79																				
80																				
81																				
82																				
83																				
84																				
85																				

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SECTION 5 - PROPOSED DEMAND AND CONSUMPTION

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90%	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
80%	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7
70%	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
60%	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
50%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												Annual	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90%	0	0	3,623	3,623	3,623	4,529	4,831	4,529	4,831	4,529	4,227	0	38,348	
80%	0	0	3,221	3,221	3,489	3,221	3,221	3,489	3,758	3,489	3,221	0	30,329	
70%	0	0	2,114	2,349	2,349	2,583	2,583	2,583	2,583	2,583	2,114	0	21,841	
60%	0	0	1,619	1,821	1,821	1,821	1,619	1,821	1,821	1,619	1,821	0	15,785	
50%	0	0	1,356	1,187	1,187	1,187	1,187	1,356	1,356	1,356	1,356	0	11,699	
40%	0	0	545	682	682	955	955	955	818	682	818	0	7,091	
30%	0	0	411	411	514	617	617	514	514	617	617	0	4,833	
20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481	
10%	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	13,166	13,570	13,941	15,189	15,288	15,524	15,958	15,321	14,450	0	132,407	

SECTION 6 - SAVINGS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
Energy Use (kw-hr)	0	0	8,306	8,238	8,202	5,612	7,526	18,026	9,205	8,164	5,680	0	78,959

Per "2011-12-13 Revised Part 2.pdf"

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ENERGY SAVINGS CALCULATIONS - INPUT DATA

VARIABLE FREQUENCY DRIVE (VFD)

SECTION 1 - GENERAL INFORMATION

6	Applicant name	Valley Asphalt Corp.
7	Facility name	581 Garver Rd, Monroe Ohio
8	ECM	ECM-4: VFD for Garver Rd Location

Driven Equipment and Motor Information

10	Equipment Identification	100 HP conveyor
11	Quantity of Equipment	1
12	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	85.0 BHP
14	Nameplate HP of Driven Equipment Motor	100.0 motor HP

SECTION 2 - BASE CONDITION OPERATION without VFD

18	% of Full Load bHP of Driven Equipment	Driven Equipment @ Actual Load (BHP)	Driven output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (see Notes 2 & 3)	Hours that each motor runs during the month (see Notes 3 & 4)												Yearly Total (hr)					
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
19	100	85.0	85%	94.5	67.10		744	672	744	720	744	735	739	704	705	744	300	320	360	320	325	320	300	2,875
20		0.0	0%	NA	#DIV/0!	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	0
21	Not Running	0.0	0%	NA	0.00	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	5,820
22	Totals						8,760	744	672	744	720	744	735	739	704	705	744	700	744	744	700	744	744	8,695

SECTION 3 - PROPOSED OPERATION with VFD

27	Efficiency of VFD	97
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29	% of Full Load Capacity of Driven Equipment	Driven Equipment @ Actual Load (BHP)	Driven output HP as % of Motor Nameplate HP	Motor Efficiency @ Motor Output HP (%)	Motor Electrical Power Draw (kw)	Hours that each motor runs during the year (Notes 2 & 3)	Hours that each motor runs during the period (see Notes 3 & 4)												Yearly Total (hr)					
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
30	100	85.0	85%	94.5	67.10		744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	0
31	90	76.5	77%	94.5	60.39	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	595
32	80	68.0	68%	94.5	53.68	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	515
33	70	59.5	60%	94.5	46.97	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	470
34	60	51.0	51%	94.0	40.47	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	400
35	50	42.5	43%	93.5	33.91	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	325
36	40	34.0	34%	93.0	27.27	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	250
37	30	25.5	26%	92.5	20.57	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	200
38	20	17.0	17%	92.0	13.78	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	180
39	10	8.5	9%	91.5	6.93	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	0
40	Total Running	NA	NA	NA	NA	8,760	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	2,935
41	Not Running	NA	NA	NA	NA	0	744	672	744	720	744	735	739	704	705	744	400	424	344	424	380	400	744	5,825
42	Totals						0	744	672	744	720	744	735	739	704	705	744	720	744	744	720	744	744	8,760

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name		Valley Asphalt Corp.																		
7	Facility name		581 Garver Rd, Monroe Ohio																		
44																					
45	NOTES:																				
46	1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD																				
47	2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., dependin																				
48	on weather conditions or other season conditions), then leave column H blank and fill in Columns I through -																				
49	3. Input values are to be entered for ONE driven equipment and its motor. The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1																				
50	4. If the motor runs continuously during a month, use the following values for the total hours for that month:																				
51	* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec																				
52	* 672 for Feb																				
53	* 720 for Apr, Jun, Sep, & Nov																				
54	If the motor runs only a percentage of the time, use a value proportional to these values																				
55																					
56																					
57																					
58																					
59																					
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SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION

	Energy Demand (kw)												Annual		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Other															0.0
Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1

	Energy Usage (kw-hr)												Annual		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	20,130	20,801	21,137	21,808	21,472	24,156	21,808	21,472	20,130	0	0	0	192,914
Total	0	0	20,130	20,801	21,137	21,808	21,472	24,156	21,808	21,472	20,130	0	0	0	192,914

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
VARIABLE FREQUENCY DRIVE (VFD)																				
SECTION 1 - GENERAL INFORMATION																				
6	Applicant name																			
7	Facility name																			
70	Valley Asphalt Corp.																			
	581 Garver Rd, Monroe Ohio																			
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	Rev. 0																			

Per "2011-12-13 Revised Part 2.pdf"

SECTION 5 - PROPOSED DEMAND AND CONSUMPTION

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90%	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
80%	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7
70%	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
60%	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
50%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0	0	0	0	0	0	0	0	0	0	0	0	0
90%	0	0	3,623	3,925	3,925	3,623	3,925	4,529	4,227	4,529	3,623	0	35,932
80%	0	0	2,684	2,684	2,952	2,684	3,221	3,489	3,489	3,489	2,952	0	27,645
70%	0	0	2,349	2,114	2,349	2,349	2,583	2,583	2,818	2,583	2,349	0	22,076
60%	0	0	1,619	1,619	1,619	1,821	1,619	1,821	2,024	2,024	2,024	0	16,190
50%	0	0	1,017	1,017	1,017	1,017	1,187	1,356	1,526	1,356	1,526	0	11,020
40%	0	0	545	682	682	682	818	818	955	818	818	0	6,818
30%	0	0	411	411	411	514	411	514	514	514	411	0	4,113
20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
10%	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	12,525	12,728	13,231	12,966	14,041	15,388	15,829	15,590	13,979	0	126,277

SECTION 6 - SAVINGS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
Energy Use (kw-hr)	0	0	7,605	8,073	7,905	8,841	7,432	8,769	5,979	5,882	6,151	0	66,637

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U			
ENERGY SAVINGS CALCULATIONS - INPUT DATA																							
VARIABLE FREQUENCY DRIVE (VFD)																							
SECTION 1 - GENERAL INFORMATION																							
6	Applicant name	Valley Asphalt Corp.																					
7	Facility name	4850 Stubbs Mill Rd, Morrow Ohio																					
8	ECM	ECM-5: VFD for Stubbs Mill Rd Location																					
10	Driven Equipment and Motor Information																						
11	Equipment Identification	100 HP conveyor																					
12	Quantity of Equipment	1																					
13	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	85.0 BHP																					
14	Nameplate HP of Driven Equipment Motor	100.0 motor HP																					
SECTION 2 - BASE CONDITION OPERATION without VFD																							
18	Hours that each motor runs during the month (see Notes 3 & 4)										Yearly Total (hr)												
19	% of Full Load bHP of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec										
20	100 %	744	672	741	696	715	707	705	830	666	710	686	744	2,796									
21	0 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
22	Not Running	0.0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0									
23	Totals														8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
SECTION 3 - PROPOSED OPERATION with VFD																							
27	Efficiency of VFD										97 %												
29	Hours that each motor runs during the period (see Notes 3 & 4)										Yearly Total (hr)												
30	% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec										
31	100 %	744	672	744	720	744	720	744	744	720	744	720	744	2,770									
32	90 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
33	80 %	744	672	744	720	744	720	744	744	720	744	720	744	5,990									
34	70 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
35	60 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
36	50 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
37	40 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
38	30 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
39	20 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
40	10 %	0	0	0	0	0	0	0	0	0	0	0	0	0									
41	Total Running	744	672	744	720	744	720	744	744	720	744	720	744	2,770									
42	Not Running	0	0	0	0	0	0	0	0	0	0	0	0	5,990									
43	Totals														0	744	672	744	720	744	720	744	8,760

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1	ENERGY SAVINGS CALCULATIONS - INPUT DATA																				
2	VARIABLE FREQUENCY DRIVE (VFD)																				
3																					
4	SECTION 1 - GENERAL INFORMATION																				
5																					
6	Applicant name		Valley Asphalt Corp.																		
7	Facility name		4850 Stubbs Mill Rd, Morrow Ohio																		
44																					
45	NOTES:																				
46	1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD																				
47	2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., dependin																				
48	on weather conditions or other season conditions), then leave column H blank and fill in Columns I through -																				
49	3. Input values are to be entered for ONE driven equipment and its motor. The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1																				
50	4. If the motor runs continuously during a month, use the following values for the total hours for that month:																				
51	* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec																				
52	* 672 for Feb																				
53	* 720 for Apr, Jun, Sep, & Nov																				
54	If the motor runs only a percentage of the time, use a value proportional to these values																				
55																					
56																					
57																					
58																					
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SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION

	Energy Demand (kw)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Other														0.0
Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1

	Energy Usage (kw-hr)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	19,929	19,191	19,191	19,929	19,191	32,611	19,191	19,191	19,191	19,191	0	187,613
Total	0	0	19,929	19,191	19,191	19,929	19,191	32,611	19,191	19,191	19,191	19,191	0	187,613

ENERGY SAVINGS CALCULATIONS - INPUT DATA

Per "2011-12-13 Revised Part 2.pdf"

VARIABLE FREQUENCY DRIVE (VFD)

SECTION 1 - GENERAL INFORMATION

6	Applicant name	Valley Asphalt Corp.
7	Facility name	4850 Stubbs Mill Rd, Morrow Ohio

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SECTION 5 - PROPOSED DEMAND AND CONSUMPTION

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90%	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4
80%	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7
70%	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
60%	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
50%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4

Energy Usage (kw-hr)

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100%	0	0	0	0	0	0	0	0	0	0	0	0	0
90%	0	0	3,623	4,227	3,925	5,133	4,831	5,435	5,435	4,529	3,925	0	41,066
80%	0	0	2,684	2,684	2,684	4,026	3,758	3,758	4,026	3,758	3,221	0	30,598
70%	0	0	2,349	2,349	2,114	1,879	1,879	2,349	1,879	1,879	1,879	0	18,553
60%	0	0	1,619	1,619	1,619	1,214	1,214	1,619	1,417	1,214	1,214	0	12,749
50%	0	0	1,017	1,017	1,356	1,017	848	848	1,017	848	848	0	8,816
40%	0	0	545	545	545	545	545	545	818	545	818	0	5,455
30%	0	0	411	411	411	411	308	308	411	411	411	0	3,496
20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
10%	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	12,525	13,129	12,931	14,502	13,659	15,138	15,279	13,460	12,592	0	123,214

SECTION 6 - SAVINGS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
Energy Use (kw-hr)	0	0	7,404	6,062	6,260	5,427	5,531	17,473	3,912	5,731	6,599	0	64,399

Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

Questions? Call 1-866-380-9580 or visit www.duke-energy.com.

Email this form along with completed Mercantile Self Direct Prescriptive or Custom applications, proof of payment, energy savings calculations and spec sheets to SelfDirect@Duke-Energy.com. You may also fax to 1-513-419-5572.

Mercantile customers, defined as using at least 700,000 kWh annually are eligible for the Mercantile Self Direct program. Please indicate mercantile qualification:

- a single Duke Energy Ohio account
 multiple accounts in Ohio (energy usage with other utilities may be counted toward the total)

Please list Duke Energy account numbers below (attach listing of multiple accounts an/or billing history for other utilities as required):

Account Number	Annual Usage	Account Number	Annual Usage
0840361601	302760	8410371101	623707
3900369201	362717		
2730214301	323903		
4390368601	234161		

Self Direct rebates are available for completed Custom projects that have not previously received a Duke Energy Smart \$aver® Custom Incentive. Self Direct incentives are applicable to Prescriptive measures that were installed more than 90 days prior to submission to Duke Energy and have not previously received a Duke Energy Prescriptive rebate.

Self Direct Program requirements dictate that certain projects that may be Prescriptive in nature under the Smart \$aver program must be evaluated using the Custom process. Use the table on page two as a guide to determine which Self Direct program fits your project(s). Apply for Self Direct projects using the appropriate application forms in conjunction with this cover sheet. Where Mercantile Self Direct Prescriptive applications are listed, please refer to the measure list on that application. If your measure is not listed, you may be eligible for a Self Direct Custom rebate. Self Direct Custom applications, like Smart \$aver Custom applications, should include detailed analysis of pre-project and post-project energy usage and project costs. Please indicate which type of rebate applications are included in the table provided on page two.

Please check each box to indicate completion of the following program requirements:

<input checked="" type="checkbox"/> All sections of appropriate application(s) are completed	<input checked="" type="checkbox"/> Proof of payment.*	<input checked="" type="checkbox"/> Manufacturer's Spec sheets	<input checked="" type="checkbox"/> Energy model/calculations and detailed inputs for Custom applications
--	--	--	---

* If a single payment record is intended to demonstrate the costs of both Prescriptive & Custom projects, please include an additional document with an estimated breakout of costs for each Prescriptive and Custom energy conservation measure.

Application Type	Replaced equipment at end of lifetime or because equipment failed**	Replaced fully operational equipment to improve efficiency***	New Construction
Lighting	MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>	MSD Prescriptive Lighting <input type="checkbox"/>	MSD Prescriptive Lighting <input type="checkbox"/>
		MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>
Heating & Cooling	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Heating & Cooling <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s) <input type="checkbox"/>	MSD Prescriptive Heating & Cooling <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s) <input type="checkbox"/>
Chillers & Thermal Storage	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Chillers & Thermal Storage <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Motors & Pumps	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Motors, Pumps & Drives <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
VFDs	Not Applicable	MSD Prescriptive Motors, Pumps & Drives <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom VFD Worksheet <input type="checkbox"/>
		MSD Custom Part 1 <input checked="" type="checkbox"/> MSD Custom VFD Worksheet <input checked="" type="checkbox"/>	
Food Service	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Food Service <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Process	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Process <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
		MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	
Energy Management Systems	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>
Behavioral*** & No/Low Cost	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>		

** Under the Self Direct program, failed equipment and equipment at the end of its useful life are evaluated differently than early replacement of fully functioning equipment. **All equipment replacements due to failure or old age will be evaluated via the Custom program.**

*** Please ensure that you include the age of the replaced equipment for measures classified as "Early Replacement" in your application as well as the estimated date that you would have otherwise replaced the existing equipment if you had not chosen a more energy efficient option.

**** Behavioral energy efficiency and demand reduction projects must be both measurable and verifiable. Provide justification with your application.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Proposed energy efficiency measures may be eligible for Self-Direct Custom rebates if they clearly reduce electrical consumption and/or demand as compared to the appropriate baseline.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee a rebate will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications cannot be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, beginning on page 6.

Notes on the Application Process

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact your Duke Energy Ohio, Inc account manager or the Duke Energy Smart \$aver® team at 1-866-380-9580.

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. Monthly calculations are best. You, the Duke Energy Ohio customer, or your equipment vendor / engineer should perform these calculations and submit them to Duke Energy for review. *We strongly encourage the use of modeling software (such as eQuest or comparable) for complex projects.*

Upon receipt of your application, an acknowledgement email will be sent to you with an estimated response time based on an initial assessment of your application. The application review may include some communication to resolve any questions about the project or to request additional information. Applications that are received complete without missing information have a faster review time.

There are two ways to submit your completed application.

Email your scanned form to: SelfDirect@duke-energy.com

Or, fax your form to 513-419-5572

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



1. Contact Information (Required)

Duke Energy Customer Contact Information					
Company Name	Valley Asphalt Corporation				
Address	11641 Mosteller Road				
Project Contact	Fred Brammer				
City	Cincinnati	State	Ohio	Zip Code	45241
Title	Plant Superintendent				
Office Phone	513-771-0820	Mobile Phone	513-535-6127	Fax	513-326-6788
E-mail Address	fred.brammer@jrjnet.com				

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	F.D. Lawrence Electric Company				
Address	3450 Beekman Street				
City	Cincinnati	State	Ohio	Zip Code	45223-2743
Project Contact	Doug Eisen				
Title	Account Representative				
Office Phone	513-542-1100	Mobile Phone	513-807-9474	Fax	513-542-2422
E-mail Address	deisen@fdlawrence.com				
Describe Role	Vendor				

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):	Valley Asphalt Corporation				
Mailing Address	11641 Mosteller Road				
City	Cincinnati	State	Ohio	Zip Code	45241
Type of organization (check one) <input type="checkbox"/> Individual/Sole Proprietor <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Partnership					
<input type="checkbox"/> Unit of Government <input type="checkbox"/> Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:	31-0515195				
Who should receive incentive payment? (select one) <input checked="" type="checkbox"/> Customer <input type="checkbox"/> Vendor (Customer must sign below)					
If the vendor is to receive payment, please sign below: I hereby authorize payment of incentive directly to vendor:					
Customer Signature _____ Date ____/____/____ (mm/dd/yyyy)					

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



2. Project Information (Required)

A. Please indicate project type:

- New Construction
- Expansion at an existing facility
- Replacing equipment due to equipment failure
- Replacing equipment that is estimated to have remaining useful life of 2 years or less
- Replacing equipment that is estimated to have remaining useful life of more than 2 years
- Behavioral, operational and/or procedural programs/projects

B. Please describe your project, or attach a detailed project description that describes the project.

Installed VFD to lower energy usage as well as demand, also to better control air flow thru plant.

C. When did you start and complete implementation?

Start date 12 / 09 (mm/yyyy) End date 5 / 10 (mm/yyyy)

D. Are you also applying for Self-Direct Prescriptive incentives and, if so, which one(s)¹?
no

E. Please indicate which worksheet(s) you are submitting for this application (check all that apply):

- Lighting
- Variable Frequency Drive (VFD)
- Compressed Air
- Energy Management System (EMS)
- General (for projects not easily submitted using one of the above worksheets)

F. Please tell us if there is anything about your electrical energy projections (either for the baseline or the proposed project) that you are either unsure about or for which you have made significant assumptions. Attach additional sheets as needed.

no

Required: Attach a supplier or contractor invoice or other equivalent information documenting the Implementation Cost for each project listed in your application. (Note: self-install costs cannot be included in the Implementation Cost)

¹ If your project involves some equipment that is eligible for prescriptive incentives and some equipment that is likely eligible for custom incentives, and if it is feasible to separate the equipment for the energy analysis, then the equipment will be evaluated separately. If it is not feasible to separate the equipment for analysis, then the equipment will be evaluated together in the custom application.

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



3. Signature (Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Fred Brammer, do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Incentives Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

Fred Brammer Valley Asphalt Corp.
Duke Energy Ohio, Inc Customer Signature

Print Name FRED BRAMMER

Date 11-30-11

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



Checklist for completing the Application

INCOMPLETE APPLICATIONS WILL RESULT IN DELAYS IN DUKE ENERGY PROCESSING YOUR APPLICATION AND NOTIFYING YOU CONCERNING ANY REBATES. Before submitting the application and the required supplementary information, use the following checklist to ensure that your application is complete and the information in the application is accurate. (Note: this checklist is for your use only – do not submit this checklist with your application)

Section No. & Title	Have You:
1. Contact Information	<input checked="" type="checkbox"/> Completed the contact information for the Duke Energy customer? <input checked="" type="checkbox"/> Completed the contact information for the equipment vendor / project engineer that can answer questions about the technical aspects of the project, if that is a different person than above?
2. Project Information	<input checked="" type="checkbox"/> Answered the questions A-E, including providing a description of your project. <input checked="" type="checkbox"/> Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	<input checked="" type="checkbox"/> Signed your name? <input checked="" type="checkbox"/> Printed your name? <input checked="" type="checkbox"/> Entered the date?
Supplementary information (Required)	<input checked="" type="checkbox"/> Attached a supplier or contractor's invoice or other equivalent information documenting the Implementation Cost for projects listed in your application? (Note: self-install costs cannot be included in the Implementation Cost) <input checked="" type="checkbox"/> (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for each project listed in your application?

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact:

- your Duke Energy account manager
- or,
- the Duke Energy Smart \$aver® team at 1-866-380-9580.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Instructions/Terms/Conditions

Note: Please keep for your records- do not submit with the application

1. Energy service companies or contractors may assist in preparing the application, but an authorized representative of the customer must sign this application to be eligible to participate in the Mercantile Self Direct Program. Completion of this application does not guarantee the approval of a Self Direct Custom Rebate.
2. Once all documentation requested in this application is received by *Duke Energy Ohio, Inc.*, and any follow-up information requested by *Duke Energy* is received, the rebate amount for each Energy Conservation Measure (ECM) will be communicated to the customer. The rebate amount will be based on ECM energy savings and ECM incremental installation cost.
3. All rebates require approval by the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc.* will submit an application for rebate on the customer's behalf upon customer attestation to program terms, conditions and requirements as outlined in the rebate offer letter and upon customer completion of attestation documents required by the Public Utilities Commission of Ohio.
4. *Duke Energy Ohio, Inc.* will issue a Self Direct Custom Rebate check, based on the approved rebate amount for each ECM, upon receiving approval from the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc.* does not guarantee PUCO approval.
5. With the application, the customer must provide a list of all sites where the ECMs were installed. *Duke Energy Ohio, Inc.* requests that sites of similar size, hours of operation and energy consuming characteristics be grouped together in one application for the determination of the rebate amount. The application should identify the site where each unique ECM was installed.
6. Based on the information submitted with the application and the information gathered both before and after the initial installation of the ECM, *Duke Energy Ohio, Inc.* will calculate the rebate amount for each ECM.
7. *Duke Energy Ohio, Inc.* may conduct random site inspections of a sample of the locations where the ECMs are installed to verify installation and operability of the ECMs and to obtain information needed to calculate the Approved Incentive Amount.
8. Customers are encouraged to retain copies of all forms, invoices and supporting documentation for their records.
9. Approved rebates are valid for 6 months from the date communicated to the customer by *Duke Energy Ohio, Inc.*, subject to the expiration of measure eligibility based on project completion dates and application submission deadlines as defined by PUCO. Customers are encouraged to execute their rebate offer contracts and PUCO-required affidavits promptly to ensure eligibility is not forfeited.
10. *Duke Energy Ohio, Inc.* reserves the right to recover all unrecoverable costs associated with the project approval if the customer decides not to execute the rebate contract, after the project is approved by *Duke Energy Ohio, Inc.*
11. Projects financially supported by other funding sources will be evaluated on a case-by-case basis for potential partial funding from *Duke Energy Ohio, Inc.*
12. Participants must be *Duke Energy Ohio, Inc.* nonresidential, mercantile customers with the project sites in the *Duke Energy Ohio, Inc.* service territory.

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



13. Customers or trade allies may not use any *Duke Energy* logo without prior written permission.
14. Only trade allies registered with *Duke Energy* are eligible to participate.
15. All equipment must be new. Used or rebuilt equipment is not eligible for incentives. All old existing equipment must be removed on retrofit projects.
16. Disclaimers: *Duke Energy Ohio, Inc*
 - a. does not endorse any particular manufacturer, product or system design within the program;
 - b. will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives;
 - c. does not expressly or implicitly warrant the performance of installed equipment. (Contact your contractor for details regarding equipment warranties.);
 - d. is not responsible for the proper disposal/recycling of any waste generated or obsolete or old equipment as a result of this project;
 - e. is not liable for any damage caused by the installation of the equipment nor for any damage caused by the malfunction of the installed equipment; and
 - f. reserves the right to change or discontinue this program at any time. The acceptance of program applications is determined solely by *Duke Energy Ohio, Inc*.

Variable speed drives for asynchronous motors

Altivar 61: Reduction of current harmonics

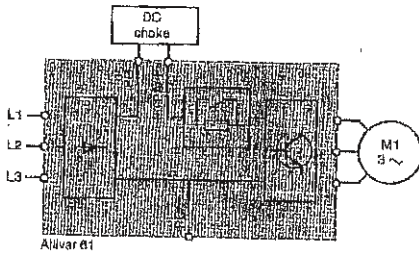
Option: DC chokes

The main solutions for reducing current harmonics are as follows:

- DC chokes, see below
- Line chokes, see page 2/228
- 16% and 10% passive filters, see page 2/231
- Use of passive filters with a DC choke, see pages 2/231 to 2/235

These 4 solutions can be used on the same installation.

It is always easier and less expensive to handle current harmonics at installation level as a whole rather than at the level of each individual unit, particularly when using passive filters and active compensators.



DC chokes

DC chokes are used to reduce current harmonics in order to comply with standard IEC 61000-3-12 for drives on which the line current is greater than 16 A and less than 75 A.

Using the DC choke with the drive complies with standard IEC 61000-3-12 provided that the RSCE ≥ 120 (1) at the point of connection to the public network. 120 represents the minimum value of RSCE (1) for which the values in table 4 of standard IEC 61000-3-12 are not exceeded.

It is the responsibility of the installer or the user to ensure that the device is connected correctly to a connection point with an RSCE ≥ 120 .

The DC choke is connected to the drive power terminals.

It is supplied as standard with ATV 61HD55M3X, HD90M3X and ATV 61HD90N4...HC63N4 drives and is integrated into ATV 61W...N4 and ATV 61W...N4C drives.

Applications

Reduction of current harmonics.

Reduction of THD to 5% or to 10% in association with passive filters, see pages 2/231 to 2/235.

Maintaining the motor torque in relation to the line choke.

(1) Short-circuit ratio

Post-it® Fax Note	7671	Date	1/24/00	# of pages	5
To	Fred Brammer	From	Sarah Kimball		
Co./Dept.		Co.	Squared		
Phone #		Phone #			
Fax #	513.326.3662	Fax #	914.217.6500		

ATTN: FRED BRAMER

Altivar® 61 Drives Electrical Specifications

Input Voltage	200 -15% to 240 +10%, 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three-Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.5 to 500 Hz
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @
Speed Reference Inputs	A1: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms A2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA, X-Y) or volt
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs; 8 logic inputs, 7 ms +/- 0.5 ms on relay out
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/Hz or SLFV (sensorless flux vector)
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O map status, Monitoring and self diagnostics with fault messages and status such as: Power on elapsed time, motor run time, line voltage, motor current, ready to run, running, motor sp
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment compliant)
Codes and Standards	UL, CSA, NOM 117, DNV, CE, C-Tick, GOST, UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

Altivar® 61 Drives Environmental Specifications

Temperature	Operation: +14 to +122°F (-10 to +50°C) Storage: -13 to +158°F (-25 to +70°C)
Humidity	95% with no condensation or dripping water, conforming to IEC 600068-2-3.
Altitude	3,300 ft. (1,000 m) without derating; 3,300-9950 ft. (1,000-3,000 m) derate output current each additional 330 ft. (100 m); 6560 ft. (2000m) maximum for corner grounded distributio
Enclosure Rating	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600-900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 25-60 hp @ 200/240 V, 30-100 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 60-125 hp @ 200/240 V, 125-900 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-1

E-Flex™

Enclosed Drive Controllers

Adjustable speed solutions for
HVAC and pump applications



Industrial-grade reliability designed for HVAC

Square D® E-Flex™ AC drives provide the optimum combination of efficiency and economy for HVAC, pump and fan applications in both commercial and industrial environments. They are the ideal choice in adjustable speed drive solutions for applications such as:

- Air Handling Units
- Supply and Return Fans
- Exhaust Fans
- Chilled Water Pumps
- Hot Water Pumps
- Cooling Tower Fans and Pumps



Seismic Qualification for New Generation of Building Codes: from the first drive manufacturer to meet seismic criteria

Square D E-Flex enclosed drive controllers are designed to meet International Building Code and ASCE 7 standards for seismic qualification in accordance with ICC ES AC156 testing protocol. Many states and jurisdictions are beginning enforcement of the seismic guidelines for installed equipment contained in the International Building Code.

E-Flex enclosed drive controllers were subjected to actual shaker table tests for seismic ratings, not just theoretical calculations for seismic ratings or obsolete requirements of the Uniform Building Code. The E-Flex enclosed drive controller provides structural integrity when installed to published guidelines and can be specified for use in applications that require $I_p = 1.5$, which means operational status can be restored after a seismic event.

Enclosure Styles

Square D E-Flex enclosed drive controllers can meet both indoor and outdoor application requirements with Type 1, Type 12/12K and Type 3R enclosures.

- Type 1 enclosures are designed specifically for indoor, non-dusty environments.
- Type 12/12K enclosures are designed for protection from dust and dripping liquid.
- Type 3R enclosures permit installation on rooftops or other outdoor locations to free up space in mechanical equipment rooms. Plus, Type 3R enclosures allow operations in temperature ranges from +14°F to +122°F (-10°C to +50°C).

Energy Efficiency

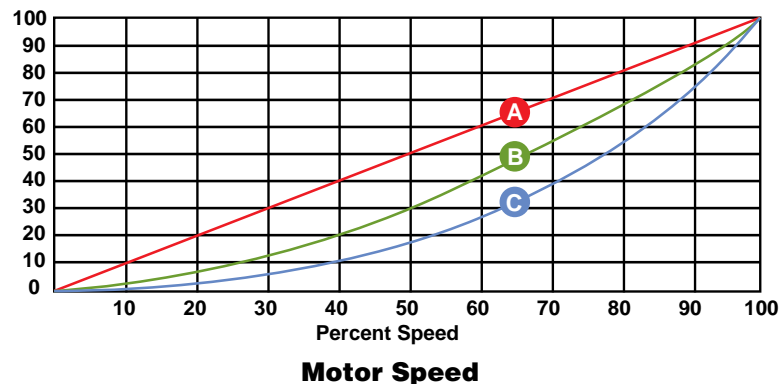
Square D E-Flex enclosed drive controllers can increase system energy efficiency by providing a means to reduce the motor speed of HVAC equipment based on the needs of the building environment (lower motor speed = lower energy costs).

Energy savings can be realized because of the Affinity laws of physics:

- Flow = f (motor speed)*
- Pressure = f (motor speed)²
- Horsepower = f (motor speed)³

A motor running at 50% of full speed capacity has a motor torque of 25% of full speed. In addition, electricity required to operate the motor at 50% of full speed is 12.5% of the amount of electricity required if the motor was running at 100% full speed capacity. Thus, reducing motor speed can significantly reduce the electrical energy consumption.

Percent
Flow, HP, Pressure



- A** = Flow as a function of motor speed
- B** = Pressure as a function of motor speed
- C** = Horsepower as a function of motor speed



An Example Energy Saving Calculation**

A fan with a 20 horsepower motor supplies air 10 hours a day for 260 days a year and the energy cost is \$0.10 cents per kilowatt-hour.

Cost of running full speed:

$$20 \text{ hp} \times 0.746 \text{ kW/hp} \times 2600 \text{ hours} \times \$0.10/\text{kWhr} = \mathbf{\$3879.20}$$

Assuming the fan does not need to run at full speed all of the time, let's use an example of:

- Running full speed (100%) for 25% of the time
- 80% speed for 50% of the time
- 60% speed for the remaining 25% of the time

Cost of running with an AC drive controlling the motor:

$$20 \text{ hp} \times (1)^3 \times 0.746 \text{ kW/hp} \times 650 \text{ hours} \times \$0.10/\text{kWhr} = \$969.80$$

$$20 \text{ hp} \times (0.8)^3 \times 0.746 \text{ kW/hp} \times 1300 \text{ hours} \times \$0.10/\text{kWhr} = \$993.08$$

$$20 \text{ hp} \times (0.6)^3 \times 0.746 \text{ kW/hp} \times 650 \text{ hours} \times \$0.10/\text{kWhr} = \$209.48$$

$$\mathbf{Total = \$2172.36}$$

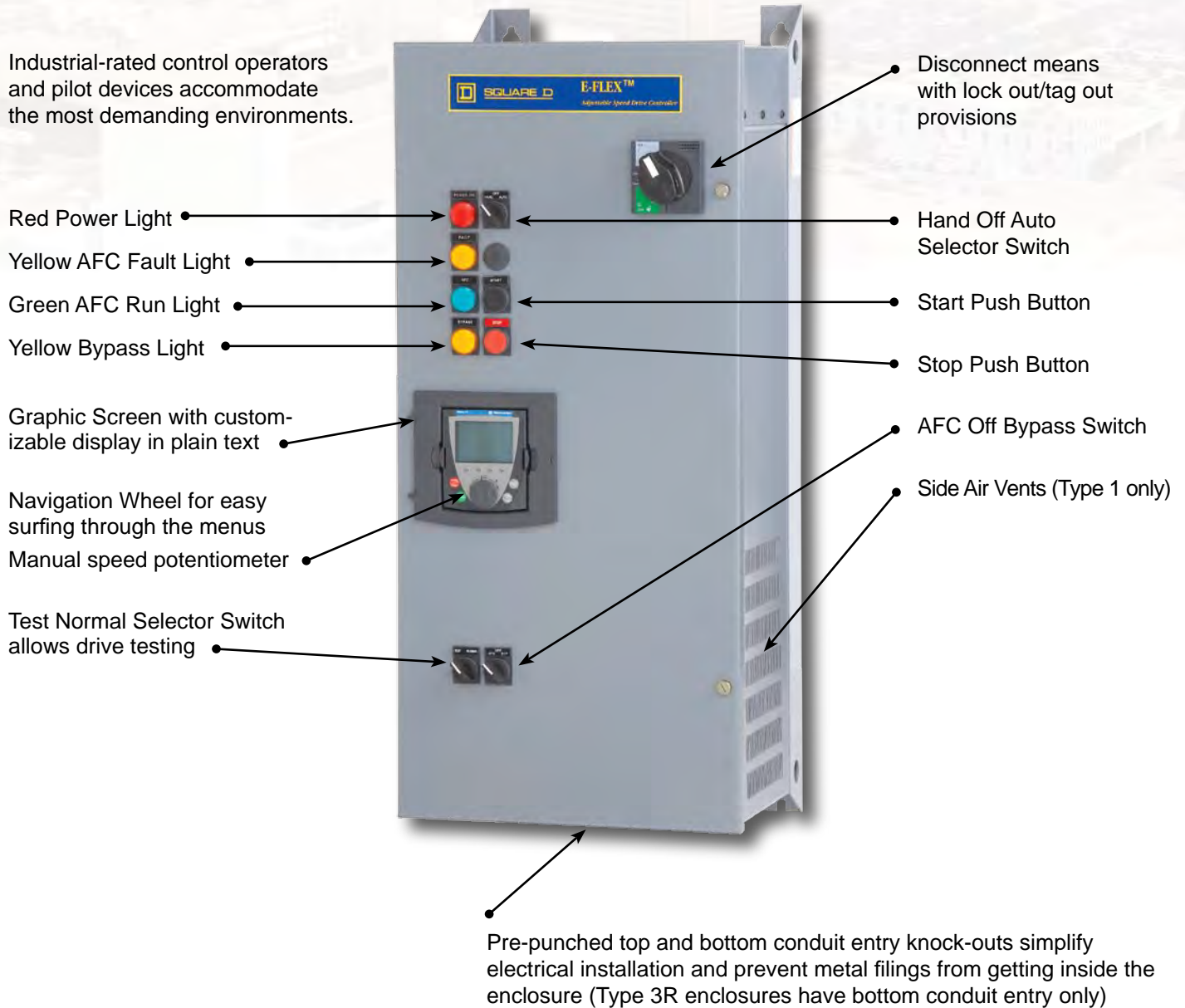
$$\mathbf{Annual savings: \$3879.20 - \$2172.36 = \$1706.84}$$

- In many instances, the payback period for using an adjustable frequency drive in place of other flow control methods is less than 18 months.

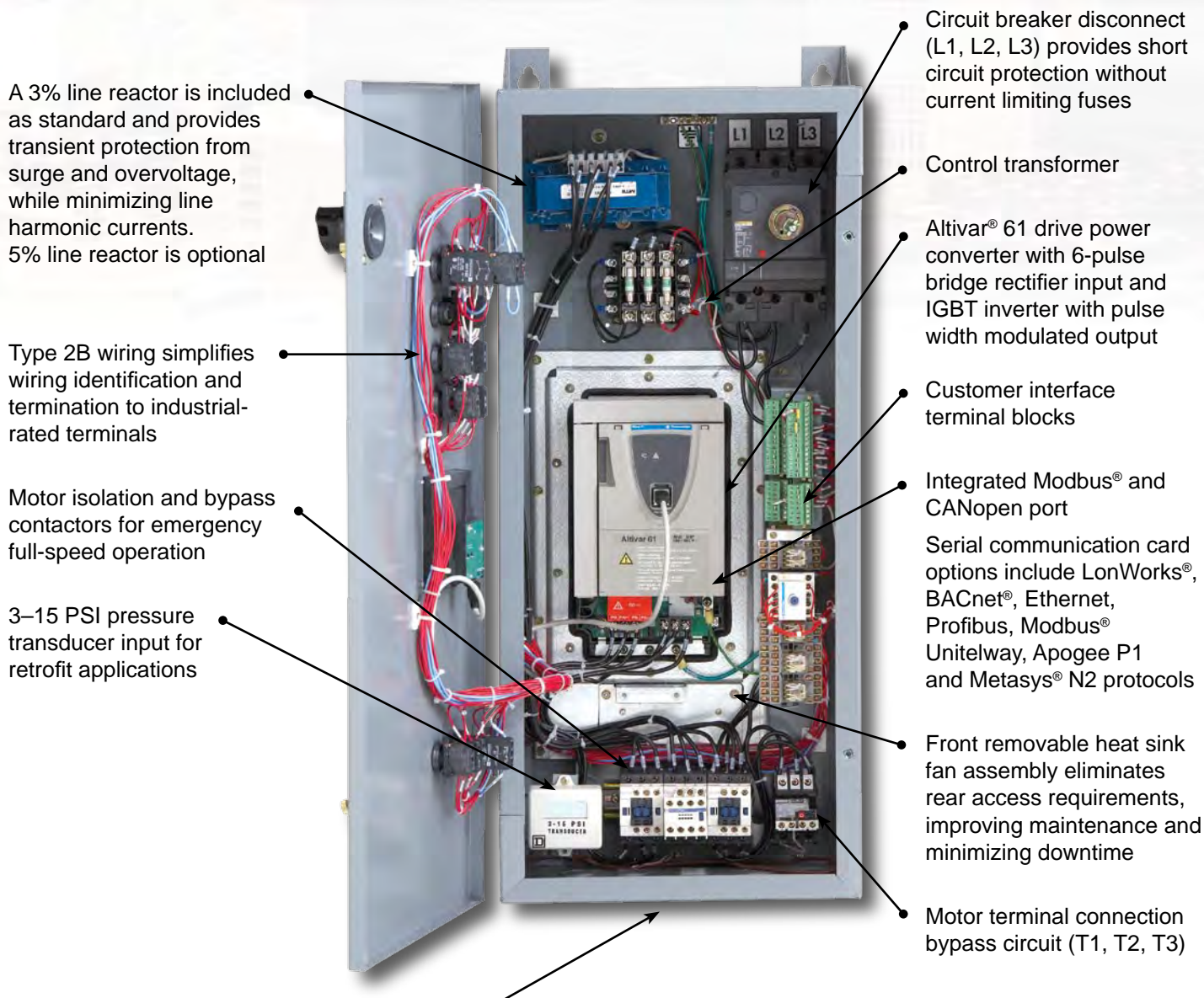
* Flow as a function of motor speed.

** Actual results may vary for closed loop pumping and variable air volume systems.

The Square D® E-Flex™ family of enclosed drive controllers is well suited for commercial building, hospital, and school HVAC applications requiring a disconnect and bypass. These controllers offer a compact metal enclosure designed to reduce Radio Frequency Interference (RFI). In addition, HVAC specific control interface is pre-programmed for HVAC variable torque operation to permit ease of set-up and installation. HVAC controls provide end damper control, smoke purge relays and fire/freezestats for full-speed fire safety override and lock-out terminations.



Fully-rated, AC3 duty-rated motor isolation and bypass contactors with mechanical and electrical interlocks prevent accidental voltage back feed. The adjustable carrier frequency is optimized at 8 kHz to reduce motor noise levels and is programmable from 0.5 kHz to 16 kHz. The advanced ASIC technology platform increases reliability and uptime and lowers the component count. The motor soft start inherent in the drive reduces mechanical stress and routine maintenance.



A 3% line reactor is included as standard and provides transient protection from surge and overvoltage, while minimizing line harmonic currents. 5% line reactor is optional

Type 2B wiring simplifies wiring identification and termination to industrial-rated terminals

Motor isolation and bypass contactors for emergency full-speed operation

3–15 PSI pressure transducer input for retrofit applications

Circuit breaker disconnect (L1, L2, L3) provides short circuit protection without current limiting fuses

Control transformer

Altivar® 61 drive power converter with 6-pulse bridge rectifier input and IGBT inverter with pulse width modulated output

Customer interface terminal blocks

Integrated Modbus® and CANopen port

Serial communication card options include LonWorks®, BACnet®, Ethernet, Profibus, Modbus® Unitelway, Apogee P1 and Metasys® N2 protocols

Front removable heat sink fan assembly eliminates rear access requirements, improving maintenance and minimizing downtime

Motor terminal connection bypass circuit (T1, T2, T3)

UL 508C listed and coordinated with NEMA ICS 7.1 standards to exceed minimum UL short-circuit requirements (this structural integrity will provide enhanced personnel safety under short-circuit conditions for the drive and bypass operation)

Selection Guide

The controller catalog number, located on the inside of the door, is coded to describe the configuration and options present. Use the following grid to translate the catalog number into a description of the controller.

Class Type

8839	EFD	•	•	•	V	•	
		1	2	3	4	5	6

Modifications

Control	Light	Misc.
•	•	•
7	8	9

1 Product

Code	Drive Type
EFD	E-Flex Controller

2 Horsepower Code

Code	HP Rating	Code	HP Rating
C	1	L	25
D	2	M	30
E	3	N	40
F	5	P	50
G	7.5	Q	60 (460 V only)
H	10	R	75 (460 V only)
J	15	S	100 (460 V only)
K	20		

3 Enclosure Type

Code	Environmental Rating
A	Type 12K
G	Type 1
H	Type 3R

4 Voltage Rating

Code	Voltage
2	208 V
3	230 V
4	460 V

5 Application Type

Code	Applied Rating
V	Variable Torque

6 Device Type

Code	Power Circuit
W ^[5]	Without Bypass
Y ^[8]	Bypass

- [1] Control option C07 (Start/Stop, Speed Potentiometer) is not compatible with Power Circuit Y Bypass or Light Option A08 or B08.
- [2] Light Option A08, B08 and C08 cannot be selected together. Select only one.
- [3] Light Option B08 is not compatible with Power Circuit W (Without Bypass).
- [4] Light Option C08 is not compatible with Control Options A07 (Hand-Off-Auto, Speed Potentiometer), B07 (Hand-Off-Auto, Start-Stop, Speed Potentiometer), D07 (Hand-Off-Comm, Speed Pot.) or E07 (Hand-Off-Comm, Start-Stop, Speed Pot.).
- [5] Line Contactor B09 is not compatible with Power Circuit W (Without Bypass).
- [6] Smoke purge E09 permits the motor to run at full speed.
- [7] Hand-Off-Auto switch must be placed in Off position for AFC fault reset.
- [8] Includes AFC-Off-Bypass switch and Test-Normal switch.
- [9] D07 or E07 must be selected.

7 Control Option

Code	AFC Controls
A07 ^[7]	Hand-Off-Auto, Speed Potentiometer
B07 ^[7]	Hand-Off-Auto, Start-Stop, Speed Potentiometer
C07 ^[1]	Start-Stop, Speed Potentiometer
D07	Hand-Off-Comm, Speed Potentiometer
E07	Hand-Off-Comm, Start-Stop, Speed Potentiometer
N07	None

8 Light Option

Code	Light Cluster
A08 ^[2]	Red Power On
	Green AFC Run
	Yellow AFC Fault
	Yellow Auto
B08 ^{[2], [3]}	Red Power On
	Green AFC Run
	Yellow AFC Fault
	Yellow Bypass
C08 ^{[2], [4]}	Red Power On
	Green AFC Run
	Yellow AFC Fault

9 Miscellaneous Option

Code	Feature
A09	Line Reactor, 5%
B09 ^[5]	Line Contactor
C09 ^[10]	3–15 PSI Transducer
D09 ^[13]	Omit Keyboard
E09 ^[6]	Smoke Purge (Fireman's Override)
F09 ^{[9], [14]}	Profibus
H09 ^[11]	I/O Extension Card, 0–20 mA
J09 ^[12]	0-10 Vdc Differential Input
K09	cUL Listing Certification
L09 ^{[14], [9]}	LonWorks
M09 ^{[14], [9]}	Modbus Unitelway
O09 ^{[14], [9]}	Apogee P1
P09 ^{[14], [9]}	Metasys N2
Q09 ^{[14], [9]}	Ethernet TCP/IP
R09 ^{[14], [9]}	BACnet
S09	End Damper Control
U09	Seismic Qualification

- [10] C09 3–15 PSI Transducer is not compatible with C07 Start-Stop, Speed Potentiometer, J09 0-10 V Auto Speed Reference or H09 Analog Card.
- [11] H09 Analog Card is not compatible with C09 3–15 PSI Transducer or Serial Communication F09, L09, M09, O09, P09, Q09, R09.
- [12] J09 0-10 V Differential Input is not compatible with C07 Start-Stop Potentiometer or C09 3-15 PSI Transducer.
- [13] Omit the keypad D09. User must buy a separate device to program the controller.
- [14] Serial communication F09, L09, M09, O09, P09, Q09 and R09 cannot be selected together. Select only one. Serial communication cannot be selected with H09.

Electrical Specifications

Input Voltage	208 V \pm 10%, 230 V \pm 10%, 460 V \pm 10%
Displacement Power Factor	98% through speed range
Input Frequency	60 Hz +/- 5%
Output Voltage	Three-phase output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.1 to 500 Hz (factory setting of 60 Hz)
Torque/Overtorque	110% of nominal motor torque for 60 s
Current (Transient)	110% of controller rated current for 60 s
Switching Frequency	Selectable from 0.5 to 16 kHz ^[1] Factory setting: 8 kHz for 208 V, 230 V and 1-100 hp @460 V
Speed Reference	AI1: 0 to +10 V, Impedance = 30 k Ω Can be used for speed potentiometer, 1–10 k Ω AI2: Factory setting: 4 to 20 mA, Impedance = 242 Ω
Factory Resolution in Analog Reference	0.1 for 100 Hz (11 bits)
Speed Regulation	V/f control: equal to the motor's rated slip SLFV (sensorless flux vector): 10% of motor's rated slip from 20% to 100% of nominal motor torque.
Efficiency	97% at full load typical
Reference Sample Time	2 ms \pm 0.5 ms
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Drive Controller Protection	Thermal protection of power converter Phase loss of AC mains circuit breaker rated at 100 kAIC
Motor Protection	Class 10 electronic overload protection Class 20 electromechanical overload protection with bypass ^[2]
Graphic Display Terminal	Self diagnostics with fault messages in three languages also refer to the Programming Manual, supplied on CD-ROM W817574030111 with power converter.
Codes and Standards	UL Listed per UL 508C under category NMMS. Conforms to applicable NEMA ICS, NFPA, and IEC standards. Manufactured under ISO 9001 standards.

[1] On 1-100 hp VT controllers, above 8 kHz, select the next largest drive controller.

[2] Class 10 electromechanical for 1 hp at 460 V.

Environmental Specifications

Temperature	Storage for all enclosures: -13°F to +149°F (-25°C to +65°C) Operation: +14°F to + 104°F (-10°C to +40°C).
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000 m) maximum without derating; derating of current by 1% for each additional 330 ft. (100 m)
Enclosure	Type 1, Type 12/12K, and Type 3R
Polution Degree	Type 1: Polution degree 2 per NEMA ICS-1 Annex A and IEC 60664-1 Type 12/12K: Pollution degree 3 per NEMA ICS-1 and IEC17.560664-1
Operational Test Vibration	Conforming to IEC 60721-3-3-3M3 amplitude 1.5 peak to peak from 3 Hz to 13 Hz 1g from 13 Hz to 200 Hz
Transit Test to Shock	Conforming to National Safe Transit Association and International Safe Transit Association test for packages
Operational Shock	15 g, 11 ms
Seismic Qualification	2003 IBC, NFPA 5000, and ASCE 7 ICC ES AC156 acceptance criteria test protocol with importance factor of 1.5

Schneider Electric is a global supplier of electrical distribution, automation and control equipment products under the brand names of Square D®, Telemecanique® and Merlin Gerin®. For over 100 years, Schneider Electric has been an innovator in manufacturing products that are tailored to the demanding specifications of our customers. Backed by a global organization of 80,000 employees in 130 countries, Schneider Electric is a global electrical industry leader. With one of the strongest distribution networks in the U.S. and around the world, you can count on Schneider Electric to keep your business running smoothly and efficiently.

Schneider Electric has been providing adjustable frequency drive solutions for HVAC and pumping applications for over 30 years. Schneider Electric has made a significant investment in research and development to design a new generation of products to serve the HVAC and pumping marketplace.

Dimensions and Weights

Type 1 or Type 12K Enclosures

HP		Height		Width		Depth		Weight	
208/230 V	460 V	mm	in.	mm	in.	mm	in.	kg.	lbs.
1–5	1–7.5	889	35	374.9	14.76	353.91	13.93	37.7	83
7.5–10	10–25	1041.4	41	521.21	20.52	353.91	13.93	57.2	126
15–25	30–50	1244.6	49	524.51	20.65	427.49	16.83	80.5	177
30–50	60–100	1600.2	63	651.51	25.65	427.49	16.83	95.9	211

Type 3R Enclosures

HP		Height		Width		Depth		Weight	
208/230 V	460 V	mm	in.	mm	in.	mm	in.	kg.	lbs.
1–5	1–7.5	889	35	620.52	24.43	347.73	13.69	52.3	115
7.5–10	10–25	1041.4	41	766.83	30.19	347.73	13.69	74.1	163
15–25	30–50	1326.39	52.22	770.13	30.32	415.04	16.34	96.8	213
30–50	60–100	1681.99	66.22	897.13	35.32	415.04	16.34	112.3	247

For additional information on Square D® E-Flex™ adjustable frequency AC drives, visit our website at www.us.squared.com.

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Schneider Electric - North American Operating Division

1415 S. Roselle Road
 Palatine, IL 60067
 Tel: 847-397-2600
 Fax: 847-925-7500